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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/973,043	10/10/2001	Haruko Kawakami	016907/1313	5062

22428 7590 09/09/2005

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EXAMINER

THOMAS, ASHISH

ART UNIT	PAPER NUMBER
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2626

DATE MAILED: 09/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/973,043

Applicant(s)

KAWAKAMI ET AL.

Examiner

Ashish K. Thomas

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13 is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-12 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/21/2002</u> | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1, 2, 4, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Usami et al(U.S Patent Number 5,844,699).

Regarding Claims 1 and 7, Usami et al discloses an image processing apparatus which processes a plurality of supplied color image signals and outputs the processed signals to an image forming apparatus, the image processing apparatus comprises of:

- A conversion section which converts said plurality of supplied color image signals to a plurality of color signals(Column 8, Lines 50-59 describes such a scenario in which supplied color image signals of Red, Green, and Blue are converted to color signals of Cyan, Magenta, and Yellow).
- A discrimination section which discriminates attributes of said plurality of supplied color image signals(Column 13, Lines 22-24 states of a discrimination section capable of differentiating some characteristics of the original image).
- A determination section which determines, based on the plurality of color signals converted by the conversion section, a plurality of color signals

outside a color gamut capable of image formation in the image forming apparatus(Column 13, Lines 9-21).

- A processing section which changes the plurality of color signals outside the color gamut determined by the determination section to a plurality of color signals in the color gamut of the image forming apparatus in accordance with a discrimination result of the discrimination section(Column 2, Lines 59-67 and Column 3, Lines 1-4 specify that if it is determined that the converted color signals are not within the outputting machine's color gamut, then the converted signals will be processed so that they are within the color gamut of the outputting machine).
- An output section which matches the plurality of color signals from the conversion section and the plurality of color signals from the processing section and delivers the matched result to the image forming apparatus(Column 4, Lines 14-17 talks about matching converted signals with an output image that is within the gamut of the output machine).

Regarding claim 2, Usami et al illustrates an image processing apparatus in which the conversion section converts a plurality of color image signals of red, green, and blue to color signals of cyan, magenta, and yellow(Column 8, Lines 50-59).

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Regarding claim 4, Usami et al specifies an image processing apparatus in which the processing section performs a color gamut compression process or a clipping process(Column 4, Lines 10-14 details a gamut compression process).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 3, 5, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S Patent 5,844,699 by Usami et al in view of U.S Pub Number 2002/0081023 by Uchida.

Regarding claim 3, Usami details an image processing apparatus capable of discriminating attributes of color image signals(Column 13, Lines 22-24). However, Usami's disclosure does not state that the said discrimination method is based on differentiating whether or not a region of an image is a character portion or a non-character portion. Uchida, on the other hand, describes a discrimination process based on character or non-character region(Paragraph, 10, Lines 1-6). It would have been obvious to one skilled in the art, at the time of the present application, to modify Usami by Uchida to formulate an image processing apparatus consisting of a discrimination section that discriminates

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whether attributes of regions, into which a whole image or screen is divided, relate to a character portion or a non-character portion.

Regarding claim 5, Usami discloses an image processing apparatus that perform a gamut compression process(Column 4, Lines 10-14). The described apparatus though does not differentiate the parameters of the compression process based on the discrimination result. Uchida meanwhile describes a scenario in which the processing section separates the parameters for image processing means depending on the discrimination signal(Paragraph 10, Lines 1-11). Therefore, it would have been obvious for one skill in the art, at the time of the present invention, to modify Usami with Uchida in order to devise an image processing apparatus consisting of a processing section which differentiates the parameters of a color gamut compression process or a clipping process in accordance with the discrimination result of the discrimination section.

Regarding claim 8 and 9, Usami et al discloses an image processing apparatus comprising of a conversion section which converts plurality of supplied color image signals to a plurality of color signals(Column 8, Lines 50-59).

As previously stated, the combined teachings of Usami et al and Uchida illustrate the possibility of devising a discrimination section which discriminates whether attributes of the plurality of supplied color image signals are of a character or a non-character portion(Usami Column 13, Lines 22-24 and Uchida Paragraph 10, Lines 1-6).

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Usami et al by itself teaches of a determination section which determines, based on the plurality of color signals converted by the conversion section, a plurality of color signals outside a color gamut capable of image formation in the image forming apparatus(Column 13, Lines 9-21).

Usami et al discloses in Column 2, Lines 59-67 thru Column 3, Line 4 a process to change color signals outside the color gamut to color signals within the color gamut of the image outputting device. However, Usami fails to disclose how to go about this process separately for a character portion and a non-character portion. Uchida indicates in Paragraph 10, Lines 1-11 of performing different types of image processing on character and non-character data. It would be obvious for one skilled in the art, at the time of the invention, to modify Usami by Uchida thereby creating a method consisting of two processing sections. The first process section performs a process to change the plurality of color signals outside the color gamut determined by the determination section to a plurality of color signals within the color gamut of the image forming apparatus, which are associated with the character portion. The second processing section performs a process to change the plurality of color signals outside the color gamut, determined by the determination section to a plurality of color signals within the color gamut of the image forming apparatus, which are associated with the non-character portion.

The aforementioned modification of Usami with references from Uchida cited so far do not provide a means for achieving a selection section. However, Uchida mentions in Paragraph 27, Lines 3-4 of an apparatus that provides the

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user the ability to select various processing options. Once again, a person skilled in the art at the time of the present invention can modify Usami with Uchida to form a selection section for effecting selection between the plurality of color signals processed by the first processing section and the plurality of color signals processed by the second processing section, depending on whether the discrimination result of the discrimination section is the character portion or the non-character portion.

Usami et al consists of an embodiment for an output section which matches the plurality of color signals selected by the selection section or the plurality of color signals subjected to the mapping process in the processing section and the plurality of color signals from the conversion section, and then delivers the matched result to the image forming apparatus(Column 4, Lines 14-18). (Usami talks about matching an image original and an output image within the color reproduction region of the output apparatus. The term "output image" is equivalent to images that are processed through the conversion section, processing section, or the selection section).

3. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S Patent Number 5,844,699 by Usami et al in view of U.S Pub Number 2002/0081023 by Uchida, U.S Patent Number 6,897,988 by Saito et al, and U.S patent Number 5,426,517 by Schwartz et al.

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Regarding claim 6, the combination of Usami and Uchida, as described beforehand, conceives an image processing apparatus that consists of a discrimination section which has the capability to differentiate between a character and non-character region. However, the combination of Usami and Uchida does not detail the type of the process that takes place if a region is deemed characterized or non-characterized. Column 3, Lines 36-43 and Column 13, Lines 61-63 of Saito et al details an image processing embodiment in which gamut mapping is achieved for a character region by giving priority to chroma. Meanwhile, Column 9, 45-54 of Schwartz details an image processing embodiment in which gamut mapping is achieved by giving priority to luminance. Incorporating Saito et al and Schwartz with the combination of Usami and Uchida can yield a device that at first differentiates if a certain region is character or non-character, and then performs a process in accordance with the discrimination result. It would have been obvious to one skilled in the art, at the time of the present application, to modify Usami and Uchida with Saito and Schwartz to form an image processing apparatus in which the processing section performs, when the discrimination result of the discrimination section is a character portion, a process of matching a hue and effecting shift to an outermost color gamut region closer in chroma than in brightness, and performs, when the discrimination result of the discrimination section is a non-character region portion, a process of matching a hue and effecting shift to an outermost color gamut region closer in luminance than in chroma.

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4. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S Patent Number 5,844,699 by Usami et al in view of U.S Pub Number 2002/0081023 by Uchida and U.S Pub Number 2002/0031256 by Hiramatsu et al.

Regarding Claim 10, Usami and Uchida teaches of an image processing apparatus that performs a color gamut mapping by comparing the character and non-character regions. They fail to teach of a mapping process that gives importance to matching of chroma. Hiramatsu et al, in Paragraph 88, illustrates a compression process in the direction of chroma. Therefore, it would have been obvious to one skilled in the art at the time of the invention to modify Usami and Uchida with Hiramatsu to formulate a processing section that performs a mapping process preferentially matching chroma of three elements of hue, chroma, and luminance, by comparing a region discriminated as the character portion by the discrimination section with a region having no character portion.

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S Patent Number 5,844,699 by Usami et al in view of U.S Pub Number 2002/0081023 by Uchida and U.S Patent Number 4,941,038 by Walowit.

Regarding Claim 11, incorporating Usami with Uchida showcases an image processing apparatus that differentiates from a character and non-character region. They also teach that image regions out of the gamut region are processed so that they are within the desired gamut region. But, the combination of Usami and Uchida fails to dwell further into how a pixel position is calculated

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while moving an image within the desired color reproduction range. Walowit specifically states that an irreproducible color is brought to the edge of the gamut by determining the shortest vector distance from the color to the gamut (Column 10, Lines 4-12). The desirable pixel position is achieved as a result. One can modify Usami and Uchida with Walowit in such a way so that it is easier to derive the closest pixel position within the color gamut as the position on an outermost color gamut region with a minimum value of a non-character region. It would have been obvious to one skilled in the art at the time of the invention to incorporate Walowit into Usami and Uchida so that the processing section performs, when the mapping process is executed to shift a pixel position outside the color gamut capable of image formation in the image forming apparatus into the color gamut, such processing that a closest pixel position within the color gamut is calculated to be a position on an outermost color gamut region with a minimum value of a non-character region, which is expressed by $a_3 \geq a_1 \geq a_2$, and $(\Delta E) = a_1(\Delta L^2) + a_2(\Delta C^2) + a_3(\Delta H^2)$ where L is luminance, C is chroma, H is hue, and a_1 , a_2 , and a_3 are weighting coefficients of the respective elements.

6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 5,844,699 by Usami et al in view of U.S. Pub Number 2002/0081023 by Uchida and U.S. Patent Number 6,014,457 by Kubo et al.

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Regarding claim 12, Usami et al describes a conversion section which converts plurality of supplied color image signals to a plurality of color signals(Column 8, Lines 50-59).

As illustrated before, the combination of Usami and Uchida achieves a discrimination section which discriminates whether attributes of regions of plurality of supplied color image signals are of a character portion or a non-character portion.

Usami and Uchida also showcases a processing section which performs a mapping process to shift color signals that are not within the color gamut into the desired color gamut. This process is accomplished by segregating character and non-character regions of the image and then applying different processing methods for each region. However, Usami and Uchida do not specify the process that happens in the character portion. Kubo et al describes an image processing apparatus which minimizes the hue shift, therefore giving little priority to hue. One can modify Usami and Uchida with Kubo in order to come up with a system that gives lower priority to hue for color processing in the character section. Therefore, it would have been obvious to one skilled in the art, at the time of present invention, to modify Usami and Uchida with Kubo to come up with a processing section which performs a mapping process to shift a plurality of color signals outside a color gamut capable of image formation in the image forming apparatus into the color gamut, on the basis of the plurality of color signals converted by the conversion section, with a priority on hue being lowered

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for easier discrimination among colors when a discrimination result of the discrimination section is the character portion and the number of colors is small.

Usami's disclosure consists of an output section which matches the plurality of color signals from the conversion section and the plurality of color signals subjected to the mapping process in the processing section, and deliver the matched result to the image forming apparatus(Column 4, Lines 14-17).

Claim Objections

7. Claim 6 is objected to as being dependent upon a rejected base claim(claim 1), but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Allowable Subject Matter

8. Claim 13 is allowed. In addition to the teachings as a whole, the prior art fails to specifically disclose an image processing apparatus that subjects the color signals to a high-region emphasis.

Conclusion

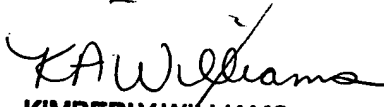
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ashish K. Thomas whose telephone number is 571-272-0631. The examiner can normally be reached on Monday through Friday, 7am to 3:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly Williams can be reached on 571-272-7471. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AKT
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KIMBERLY WILLIAMS
SUPERVISORY PATENT EXAMINER